

## CLAIMS

1. A method of configuring a connectivity unit associated with a user for communication  
 5 with a service entity across a communications infrastructure, said connectivity unit having configuration communications parameters pre-installed therein prior to the user taking possession of the unit, said method comprising:
  - a **first phase** in which the user communicates with a configuration service and passes to  
 10 the latter user-related information including an identity data item, said user-related information being placed in a corresponding computer record of a data processing system of the configuration service;
  - a **second phase** in which the connectivity unit initiates communication between itself and  
 15 the data processing system of the configuration service across the communications infrastructure by using said preloaded configuration communications parameters, the connectivity unit being identified to the data processing system by said identity data item being passed across the communications infrastructure to the data processing  
 20 system, and the data processing system using said identity data item to access the related said computer record and thereafter transmit to the connectivity unit operational communications parameters for use by the connectivity unit for communicating with said service entity, said operational communication parameters  
 25 being derived by said configuration service on the basis of the user-related information received in said first phase for the user concerned.
  
2. A method according to claim 1, wherein the configuration service includes a call center,  
 25 the user passing said user-related information to the configuration service during said first phase by communicating with the call center in one of the following ways:
  - directly by telephone;
  - directly by an electronic messaging system;
  - indirectly through a third party who contacts the call center by telephone;
  - 30 - indirectly through a third party who contacts the call center by an electronic messaging system.

3. A method according to claim 1, wherein the said identity data item of the user-related information is an identity sequence specific to the connectivity unit.
4. A method according to claim 3, wherein the second phase is automatically carried out upon the connectivity unit being powered up and connected to said communications infrastructure without the user having to input any data into the connectivity unit, the identity sequence of the connectivity unit being stored in a memory of the unit.
5. A method according to claim 3, wherein the pre-installed configuration communications parameters include a public-key / private-key cryptographic key pair with an identity-sequence certificate linking the public key to the identity sequence of the connectivity unit; the said second phase involving an authentication process in which the identity-sequence certificate is passed by the connectivity unit to the data processing system which verifies the authenticity of the certificate and thus of the association between the public key and identity sequence in the certificate.
6. A method according to claim 5, wherein the authentication process further involves a cryptographic-based challenge-response interchange conducted between the connectivity unit and data processing system to confirm that the connectivity unit is the possessor of the private key related to the public key passed in the identity-sequence certificate whereby to authenticate the unit as the one bearing the identity sequence included in the certificate.
7. A method according to claim 1, wherein the communications infrastructure comprises a telephone network to which the user is a subscriber, the connectivity unit connecting to the communications infrastructure through the user's subscriber's connection; said identity data item being the telephone number of the user.
8. A method according to claim 7, wherein the second phase is automatically carried out upon the connectivity unit being powered up and connected to said communications infrastructure without the user having to input any data into the connectivity unit, the telephone number of the user being provided to the data processing system in said second phase on the basis of caller-id signalling information generated in the telephone network

when the connectivity unit initiates communication with the data processing system at the start of the second phase.

9. A method according to claim 1, wherein said user-related information includes an identity sequence specific to the connectivity unit and the pre-installed configuration communications parameters held by the connectivity unit include a public-key / private-key cryptographic key pair with an identity-sequence certificate linking the public key to the identity sequence of the connectivity unit; the said second phase involving an authentication process in which the identity-sequence certificate is passed by the connectivity unit to the data processing system which verifies the authenticity of the certificate and thus of the association between the public key and identity sequence in the certificate; and the operational communications parameters transmitted from the data processing system to the connectivity unit including a user-identity certificate linking the public key of the connectivity unit to a user-identity element which forms part of, or is derived from, said user-related information and which is held in the computer record associated with the user concerned, said user-identity certificate being subsequently used by the connectivity unit for authenticating itself to said service entity.
10. A method according to claim 9, wherein said authentication process further involves a cryptographic-based challenge-response interchange conducted between the connectivity unit and data processing system to confirm that the connectivity unit is the possessor of the private key related to the public key passed in the identity-sequence certificate whereby to authenticate the unit as the one bearing the identity sequence included in the certificate.
11. A method according claim 1, wherein the communications infrastructure comprises a data network to which the data processing system of the configuration service is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through a data-network access point, the said second phase involving the following steps:
  - (a) - the connectivity unit connects via the user's subscriber connection across the access network to the data-network access point using addressing information for the latter held as part of said configuration communication parameters;

- (b) - the data-network access point authorises access by the connectivity unit to the data network on the basis of a username and password which are included in said configuration communications parameters and are passed to the access point by the connectivity unit, the data-network access point effecting this authorisation by using the services of an authorisation server of said data processing system;
- (c) - upon access being authorised in step (b), the data-network access point assigns an address for the connectivity unit on the data network and passes this address to the authorisation server which in turn passes it to a configuration manager of the data processing system; and
- (d) - the configuration manager prompted by the authorisation server in step (c) contacts the connectivity unit at the assigned address of the latter on the data network and downloads said operational communication parameters to the connectivity unit.
12. A method according to claim 11, wherein the connectivity unit stores an identity sequence specific to the connectivity unit, this identity sequence being included in the user name passed to the authorisation server and being checked by the latter against a database of valid identity sequences, access to the data network only being authorised if the identity sequence included in the user name is a valid one.
13. A method according to claim 11, wherein the connectivity unit stores an identity sequence specific to the connectivity unit and the authorisation server is associated with a configuration domain; the username passed by the connectivity unit to the data-network access point being of the form:
- identity sequence of connectivity unit @ configuration\_domain
- and the data-network access point recognising the configuration\_domain as indicating the authorisation server to be used and thereupon contacting the latter over the data network and passing it the identity sequence contained in the username it received from the connectivity unit.
14. A method according to claim 11, wherein an identifier of the subscriber-connection on the access network is passed to the data-network access point in signalling information of the access network, this subscriber-connection identifier being passed on by the data-

network access point to the authorisation server which in turn passes it to the configuration manager.

15 A method according to claim 14, wherein said subscriber-connection identifier is stored by the configuration manager in the computer record of the related user.

16. A method according to claim 14, wherein said subscriber-connection identifier constitutes said identity data item and is used, upon being received by the configuration manager from the authorisation server, to access the corresponding user computer record.

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17. A method according claim 1, wherein the communications infrastructure comprises a data network to which the data processing system of the configuration service is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through a data-network access point, the said second phase involving the following steps:

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(a) - the connectivity unit connects via the user's subscriber connection across the access network to the data-network access point using addressing information for the latter held as part of said configuration communication parameters;

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(b) - the data-network access point authorises access by the connectivity unit to the data network on the basis of a username and password which are included in said configuration communications parameters and are passed to the access point by the connectivity unit, the data-network access point effecting this authorisation by using the services of an authorisation server of said data processing system;

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(c) - upon access being authorised in step (b), the data-network access point assigns an address for the connectivity unit on the data network and passes this address to the connectivity unit; and

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(d) - the connectivity unit contacts the configuration manager over the data network at an address held by the connectivity unit as part of said configuration communication parameters, the configuration manager subsequently transmitting said operational communication parameters to the connectivity unit.

18. A method according to claim 17, wherein the connectivity unit stores an identity sequence specific to the connectivity unit, this identity sequence being included in the user name passed to the authorisation server and being checked by the latter against a database of valid identity sequences, access to the data network only being authorised if the identity sequence included in the user name is a valid one.

19. A method according to claim 17, wherein the connectivity unit stores an identity sequence specific to the connectivity unit and the authorisation server is associated with a configuration domain; the username passed by the connectivity unit to the data-network access point being of the form:

identity sequence of connectivity unit @ configuration\_domain

and the data-network access point recognising the configuration\_domain as indicating the authorisation server to be used and thereupon contacting the latter over the data network and passing it the identity sequence contained in the username it received from the connectivity unit.

20. A method according to claim 17, wherein an identifier of the subscriber-connection on the access network is passed to the data-network access point in signalling information of the access network, this subscriber-connection identifier being passed on by the data-network access point to the authorisation server which in turn passes it to the configuration manager.

21. A method according to claim 1, further comprising a **third phase** in which at the end of said second phase the data processing system initiates the sending of a wake-up indication to the connectivity unit, the latter responding to receipt of this indication by seeking to connect across the communications infrastructure to the service entity using the said operational communications parameters passed to it during said second phase whereby to check that the connectivity unit has been correctly configured for communication with the service entity.

**22.** A method according to claim 21, wherein said service entity facilitates the setting up of a communication connection over the communications infrastructure between the connectivity unit and a selected end system, and wherein:

- (a) - in the course of said first phase, an electronic address book is created in the service system for said user using information provided by the user, entries in the address book corresponding to particular end systems, and
- (b) - upon communication being established between the connectivity entity and the service entity during said third phase, the service entity passes a copy of the electronic address book to the connectivity unit.

**23.** A method according claim 21, wherein the communications infrastructure comprises a data network to which the data processing system of the configuration service is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through a data-network access point; and wherein an identifier of the subscriber connection on said access network is stored in the computer record of the user and said wake-up indication takes the form of a call placed to said subscriber connection.

**24.** A method according to claim 23, wherein said subscriber-connection identity is entered into said computer record during said second phase, the subscriber-connection identifier being passed to the data-network access point in signalling information of the access network and then being forwarded to the data processing system of the configuration service for entry into said computer record.

**25.** A method according to claim 1, including a further phase of reconfiguring the connectivity unit in which the configuration service transmits to the connectivity unit across the communications infrastructure a new set of operational communications parameters which the connectivity unit thereafter uses when accessing the service entity, said further phase being initiated by the configuration service setting a reconfiguration indicator which the connectivity unit reads during subsequent communication with the service entity.

**26.** A method according to claim 25, wherein said further phase is initiated by the configuration service selectively:

- in an active manner, by waking up the connectivity unit to cause it to communicate with the service entity; or
- in a passive manner, by waiting until the connectivity unit next connects to the service entity.

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27. A method according to claim 25, wherein:

- the communications infrastructure comprises a data network to which the data processing system of the configuration service is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through data-network access points;
- said preloaded configuration communications parameters comprise parameters for accessing the data network through a first one of said data-network access points, and said operational communications parameters comprise parameters for accessing said data network through a second one of said data-network access points, the connectivity unit using the first data-network access point for accessing the configuration service during said second phase and the second data-network access point for subsequently accessing said service entity; and
- said reconfiguration indicator is selectively set by the configuration service to further indicate to the connectivity unit which of said first and second data-network access points is to be used for receiving the new operational communications parameters in said further phase, the connectivity unit on communicating with the service entity through the second data-network access point and ascertaining from said reconfiguration indicator that the first data-network access point is to be used to receive new operational parameters, thereafter connecting to the configuration service through that access.

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28. A method according to claim 27, wherein use of the first data-network access point is without charge to the user whereas use of the second data-network access point by the user is subject to a charge.

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29. A method according to claim 1, including a further phase of reconfiguring the connectivity unit in which the configuration service transmits to the connectivity unit across



the communications infrastructure a new set of operational communications parameters which the connectivity unit thereafter uses when accessing the service entity, said further phase being initiated by the connectivity unit contacting the configuration service.

5 30. A method according to claim 1, wherein the communications infrastructure comprises a data network to which the data processing system of the configuration service is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through data-network access points; said preloaded configuration communication parameters comprising data for accessing the data network through a first  
10 one of said data-network access points, and said operational communications parameters comprising data for accessing said data network through a second one of said data-network access points, the connectivity unit using said first data-network access point for accessing the configuration service during second phase and said second data-network access point for subsequently accessing said service entity.

15 31. A configuration service system for configuring a connectivity unit for communication with a service entity across a communications infrastructure, said connectivity unit having configuration communications parameters pre-installed therein prior to a user taking possession of the unit, the configuration service system comprising:

- 20 - a data processing system including a store for holding user-related information;  
- a call center to which user-related information about a new user of a connectivity unit can be passed for entry into the data processing system for storage in said store; the user-related information including an identity data item; and  
- interface means for interfacing the data processing system with the communications  
25 infrastructure whereby to enable communication between the data processing system and the connectivity unit of the new user; access to the data processing system through the interface means requiring knowledge of at least one said configuration communications parameter;

the data processing system further including:

- 30 - means for accessing the user-related information held in said store on the basis of a said identity data item received across the communications infrastructure during the

course of communication with a said connectivity unit, this identity data item serving to identify the connectivity unit to the data processing system;

- means for deriving for the connectivity unit of said new user, operational communication parameters on the basis of said user-related information; and
- 5 - means for transmitting said operational communications parameters to the connectivity unit operational for use by the latter for communicating with said service entity.

32. A configuration service system according to claim 29, wherein the said identity data

- 10 item is an identity sequence specific to the connectivity unit and the pre-installed configuration communications parameters include a public-key / private-key cryptographic key pair with an identity-sequence certificate linking the public key to the identity sequence of the connectivity unit; the data processing system having authentication means comprising means for verifying the authenticity of a said identity-sequence certificate passed by the
- 15 connectivity unit to the data processing system whereby to verify the association between the public key and identity sequence in the certificate.

33. A configuration service system according to claim 29, wherein the authentication means further comprises means for effecting a cryptographic-based challenge-response interchange

- 20 between the connectivity unit and data processing system whereby to confirm that the connectivity unit is the possessor of the private key related to the public key passed in the identity-sequence certificate and thereby authenticate the unit as the one bearing the identity sequence included in the certificate.

34. A configuration service system according to claim 31, wherein said identity data item is a telephone number associated with the user, the data processing system being arranged to receive this telephone number over the communications infrastructure as data extracted from signalling information of a telephone network to which the user is a subscriber.

35. A configuration service system according claim 31 intended for use with a communications infrastructure comprising a data network, and an access network to which the user has a subscriber connection and which provides access to the data network through

a data-network access point; the configuration service system having its interface means connected to the data network and further comprising an authorisation server for providing a logon authorisation service to said data-network access point in respect of connectivity units requesting access to the configuration service system through that access point.

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**36.** A configuration service system according to claim 31, further comprising means for sending a wakeup indication to said connectivity unit for causing the latter to contact said service entity, the data processing system after transmitting said operational communications parameters to the connectivity unit triggering the wakeup means to send a  
10 said wakeup indication to the connectivity unit after the latter has terminated its communication with the data processing system.

**37.** A configuration service system according claim 36, wherein the communications infrastructure comprises a data network to which the interface means of the configuration  
15 service system is connected, and an access network to which the user has a subscriber connection and which provides access to the data network through a data-network access point; said user-related information held in said store including an identifier of the subscriber connection on said access network and said wake-up indication placed by the wakeup means taking the form of a call to said subscriber connection.

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**38.** A connectivity unit for communicating with a service entity across a communications infrastructure, said connectivity unit comprising:

- a store holding configuration communications parameters including a public-key / private-key cryptographic key pair with an identity-sequence certificate linking the  
25 public key to an identity sequence specific to the connectivity unit;
- communication means for establishing communication across said communications infrastructure with a remote entity in accordance with communications parameters held in said store, the communications means including authentication means for authenticating the connectivity unit to the remote entity, the authentication means  
30 comprising means for passing a key certificate to the remote entity, and
- configuration initiation means for causing the communication means to establish communication across said communications infrastructure with a configuration service

by using said configuration communications parameters held in said store, the said key certificate used by the authentication means being the identity-sequence certificate;

- download means for downloading operational communications parameters from the configuration service and storing them in said store; and
- operational control means for causing the communication means to establish communication across said communications infrastructure with said service entity by using said operational communications parameters held in said store.

39. A connectivity unit according to claim 38, wherein said authentications further comprises means for generating and returning a response to a challenge issued by the remote entity, the generation of the response involving the use of said private key to effect a cryptographic operation on data included in the challenge.

40. A connectivity unit according to claim 38, wherein said configuration initiation means is responsive to the absence of valid operational communications parameters in said store upon the connectivity unit being powered up and connected to the communications infrastructure, to automatically trigger the communication means to establish communications with the configuration service without requiring the input of data by a user.

41. A connectivity unit according to claim 38, wherein the communication means is operative to establish communication across a communications infrastructure that comprises a data network, and an access network to which the user of the connectivity unit has a subscriber connection and which provides access to the data network through a data-network access point, access to the data network through said data-network access point being subject to a username/password authorisation process; said configuration communications parameters held in said store further including the access-network address of the data-network access point and a username and password for use in said authorisation process, said username including said identity sequence specific to the connectivity unit.

42. A connectivity unit according to claim 41, wherein the username included in said configuration communications parameters is of the form:

identity sequence of connectivity unit @ configuration\_domain

where the configuration\_domain serves to indicate to the data-network access point an authorisation server to be used in the authorisation process.

- 5    43. A connectivity unit according to claim 38, wherein the operational communications parameters include a user-identity certificate linking the said public key to the identity of a user associated with connectivity unit, the user-identity certificate being used as said key certificate by the authentication means for authenticating the connectivity unit to the service entity upon the operational control means causing the communication means to establish  
10    communication with the service entity.
44. A connectivity unit for communicating with a service entity across a communications infrastructure, said connectivity unit comprising:
- a store holding an identity sequence specific to the connectivity unit and pre-installed  
15    configuration communications parameters;
  - communication means for establishing communication across said communications infrastructure with a remote entity in accordance with communications parameters held in said store,
  - configuration initiation means for causing the communication means to establish  
20    communication across said communications infrastructure with a configuration service by using said configuration communications parameters held in said store;
  - identification means operative upon the communication means establishing communication with the configuration service, to identify the connectivity unit to the configuration service on the basis of said identity sequence specific to the connectivity  
25    unit;
  - download means for downloading operational communications parameters from the configuration service and storing them in said store; and
  - operational control means for causing the communication means to establish  
30    communication across said communications infrastructure with said service entity by using said operational communications parameters held in said store;
- the configuration initiation means being responsive to the absence of valid operational communications parameters in said store upon the connectivity unit being powered up and

connected to the communications infrastructure, to automatically trigger the communication means to establish communications with the configuration service without requiring the input of data by a user.